Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A reactor core capable of being mounted in a lower portion of a reactor pressure vessel comprising a core support plate mounted on the lower portion in the reactor pressure vessel and an upper grid disposed on and above the core support plate, said reactor core comprising[[;]] :

a plurality of fuel assemblies ~~which are~~ configured to be supported by the core support plate and the upper grid so as to be arranged in a square grid form at a certain pitch; and

a plurality of control rods having a cruciform cross-section comprising four blades each having a width (B), each of said control rods being adapted for insertion into four adjacent spaces between four fuel assemblies facing each other, wherein a ratio (B/S) of the width (B) of the control rod blades to a surface area (S) of a square having sides each being equal to the pitch between the fuel assemblies is set in a range of 0.06 to 0.08 cm^{-1}.

2. (Currently Amended) A reactor core as claimed in claim 1, wherein said fuel assemblies ~~are arranged~~ comprise fuel rods and said fuel rods contain uranium, plutonium, or oxides or nitrides of the two elements as [[the]] nuclear fuel material.

3. (Withdrawn) A reactor core [[is]] as claimed in claim 2, wherein said fuel rods disposed around said fuel assemblies contain thorium as the nuclear fuel material.

4. – 5. (Canceled)

6. (Previously Presented) A reactor core as claimed in claim 15, wherein said burnable poison is a gadolinia product, and combined enrichment of gadolinium isotopes with odd mass numbers in said gadolinia product is greater than the enrichment of natural gadolinium.

7. (Withdrawn) A reactor core as claimed in ~~claims~~ claim 1, wherein a fuel assembly has a plurality of fuel rods ~~changed~~ charged with a fissionable material thereinto, and [[the]] a mean enrichment of said fissionable material is the same for all loaded fuel assemblies.

8. – 10. (Canceled)

11. (Withdrawn) A method for operating a nuclear reactor, comprising the steps of:

mounting a reactor core on a lower portion in a reactor pressure vessel;

arranging a plurality of fuel assemblies in said reactor core in a square grid at a certain pitch;

inserting a plurality of cross-sectional cruciform control rods into four adjacent spaces formed by [[said]] four fuel assemblies facing each other;

setting a numeric value of 0.06 cm^{-1} or greater which is selected for a ratio (B/S) of a width (B) of each blade on said control rods [[and]] to a surface area (S) of a ~~fuel lattice defined by a surface are square whose said is equal to a~~ square having sides each being equal to the pitch between said fuel assemblies; and

operating at an excess reactivity of no less than 5% Δk and no more than 10% Δk.

12. (Withdrawn) A method for operating a nuclear reactor, as claimed in claim 11, wherein said operating is effected such that the maximum value of a core-averaged void coefficient observed during power operation of said nuclear reactor is generated at a time other than the end of an operating cycle, the minimum value of said core-averaged void coefficient is generated at the end of the operating cycle, and the difference between the minimum and maximum values of the core-averaged void coefficient is kept at 20% or greater.

13. (Withdrawn) A method for operating a nuclear reactor, as claimed in claim 11, wherein said reactor core is operated with said control rods inserted into said reactor core by 30% or greater of axial length of said control rods.

14. (Withdrawn) A method for operating a nuclear reactor, as claimed in claim 12, wherein said reactor core is operated with said control rods inserted into said reactor core by 30% or greater of axial length of said control rods.

15. (Previously Presented) The reactor core according to claim 1, wherein the fuel assembly includes some fuel rods comprising a fuel composition comprising a nuclear fuel material and a burnable poison, said burnable poison is a gadolinia product containing pure particles or grains of Gd_2O_3, with a diameter in a range of 50 to 200 microns dispersed throughout the nuclear fuel material, and the gadolinia particles or grains have a weight ratio of 15 weight % or more with respect to the fuel composition.

16. (Canceled)